



Germane (GeH₄)

9602-6902

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MST Gas Sensors 9602 are only intended for use with the following Honeywell Analytics gas detectors:



Satellite Series



Sat-Ex



Satellite Portable Gas Detector

Please refer to the specific gas detector's Operational Manual for further details.

Germane (GeH₄)	
Sensor Type	GeH ₄ , Germane (with H ₂ S Filter)
Part Number	9602-6902
Measuring Principle	Amperometric 3-electrode sensor
Color of Sensor Cap	Grey beige
Specific Sensor Data	Programmed on PROM inside the sensor
Standard Range	0.0 to 5.0ppm
Lower Detectable Limit (LDL)	0.2ppm
Maximum Range	10.0ppm
Long-term Sensitivity Drift	< 5% / 6 months
Deviation from Linearity (within Standard Range)	< 10% FS
Zero Current at Normal Conditions	Below LDL
Sensitivity	150 to 500 nA/ppm
Response Time	Constant within standard range
t₅₀	< 10 s (based on 2 min exposure time)
t₉₀	< 30 s (based on 2 min exposure time)
Sensor Warm-up Time	5 s
Operating Temperature	-20°C to +40°C continuous; -40°C to +50°C intermittent
Operating Humidity	10% to 95% r.h. non condensing
Storage Conditions	0°C to +4°C; 40% to 60% r.h. non-condensing
Temperature Dependence	Compensated with microprocessor
Sensor Life Expectancy	≥ 24 months under typical application conditions
Sensor Dimensions	
Height	43mm (1.69")
Diameter	20.5mm (0.80")
Weight	9g (0.31oz)

Note:

All response data given are typical values and related to the sensor being used under normal conditions, i.e. temperature 20°C, r.h. 40-60%, 1013 hPa. H₂S filter capacity 20 ppmh.

General Specification



As with all electrochemical sensor cells, dramatic output changes in reported concentrations can be expected under rapidly changing environmental conditions. Please ensure sensors are located in areas not prone to sudden changes in humidity and temperature.

Actual readings may be affected by flow rates and absorption on tubing and other gas path surfaces.

All sensors are shipped pre-calibrated to traceable national standards. Dependent on actual operating conditions and overall exposure to gases, checking, calibration or exchange is subject to local regulations or site practices.

1. How do electrochemical sensors work?

All Honeywell Analytics electrochemical sensor cells are amperometric type i.e. are fuel cell type acting like batteries, where one component, in order to generate a current, is missing: the gas that should be detected (target gas).

The target gas diffuses through a gas permeable membrane into the sensor where an electrochemical reaction results in a low current that is direct proportional to the measured gas concentration (generally in nA/ppm reading).

2. How does the electrochemical sensor work with the detection instrument?

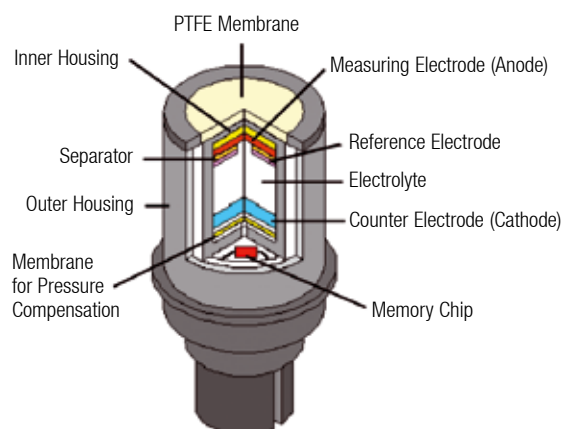
The current is amplified to a signal that is processed through an electronic circuit in order to display the real-time gas concentration.

The zero current of the electrochemical cell is always present and is monitored and suppressed by the electronics.

There are different ways to adjust the correct amplification factor of the electronics. Honeywell Analytics has created the "intelligent sensor" which features a built-in PROM. All relevant sensor data such as sensitivity, target gas, date of first calibration, calibration data, zero current, and alarm levels are programmed onto this chip. Our detectors can read this data and adjust the amplifying factor automatically.

3. How does a sensor self-test work?

All relevant sensor data (ref. Pos 2) are programmed onto the PROM inside the electrochemical sensor. Our detectors can read this data. Every 24 hours an automatic sensor self-test is performed, which compares an electronically initiated sensor signal with the stored calibration curve. This makes sure that the sensors are always within specification that is set during the first calibration. If the sensor is out of specification the instrument will indicate that the sensor either needs to be checked or needs to be replaced.



Cross Sensitivities

Each MST Gas Sensor 9602 is potentially cross sensitive to other gases and this may cause a gas reading when exposed to other gases than those originally designated. The table to the right presents typical readings that will be observed when a new sensor is exposed to the cross sensitive gas (or a mixture of gases containing the cross sensitive species).

Notes:

1. Test Conditions: T=20°C, P=1013 hPa, Flow Rate = 30 l/h
2. Please note that the values stated are approximate values.
3. Interference factors may differ from sensor to sensor and with lifetime.
4. This table does not claim to be complete. The sensor might also be sensitive to other gases.
5. The Satellite, Satex and Satellite PGD products do not display negative readings. The display will show zero for any negative readings.
6. It is not recommended to use cross sensitivity factors to enable cross calibration. The target gas should be used for calibration.

Gas / Vapour	Chemical Formula	Concentration Applied (ppm)	Reading (ppm GeH ₄)
Ammonia	NH ₃	108	<1
Arsine	AsH ₃	0.15	0.85
Carbon Dioxide	CO ₂	5000	0
Carbon Monoxide	CO	85	0
Chlorine	Cl ₂	0.85	-0.2
Diborane	B ₂ H ₆	0.2	1.5
Disilane	Si ₂ H ₆	0.27	0.7
Hydrocarbons	CH ₄	18000	<0.01
Hydrogen	H ₂	3100	<0.15
Hydrogen Chloride	HCl	7.9	0
Hydrogen Cyanide	HCN	12.6	4
Hydrogen Fluoride	HF	7.2	0
Hydrogen Selenide	H ₂ Se	0.85	0
Hydrogen Sulphide	H ₂ S	18.1	0
Nitrogen Dioxide	NO ₂	10.1	-12.5
Phosphine	PH ₃	0.18	1.6
Propan-2-ol	C ₃ H ₅ OH	20000	<0.15
Silane	SiH ₄	4.4	3.7
Sulphur Dioxide	SO ₂	17.8	0

Our Product Range



Fixed Gas Monitoring

Honeywell Analytics offers a wide range of fixed gas detection solutions for a diverse array of industries and applications including: Commercial properties, industrial applications, semiconductor manufacturers, energy plants and petrochemical sites.

- » Detection of flammable, oxygen and toxic gases (including exotics)
- » Innovative use of 4 core sensing technologies – paper tape, electrochemical cell, catalytic bead and infrared
- » Capability to detect down to Parts Per Billion (ppb) or Percent by Volume (%v/v)
- » Cost effective regulatory compliance solutions

Portable Gas Monitoring

When it comes to personal protection from gas hazards, Honeywell Analytics has a wide range of reliable solutions ideally suited for use in confined or enclosed spaces.

These include:

- » Detection of flammable, oxygen and toxic gases
- » Single gas personal monitors – worn by the individual
- » Multi-gas portable gas monitors – used for confined space entry and regulatory compliance
- » Multi-gas transportable monitors – used for temporary protection of area during site construction and maintenance activities

Technical Services

At Honeywell Analytics, we believe in the value of great service and customer care. Our key commitment is providing complete and total customer satisfaction. Here are just a few of the services we can offer:

- » Full technical support
- » Expert team on hand to answer questions and queries
- » Fully equipped workshops to ensure quick turnaround on repairs
- » Comprehensive service engineer network
- » Training on product use and maintenance
- » Mobile calibration service
- » Customised programmes of preventative/corrective maintenance
- » Extended warranties on products

Find out more

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